

交点队列型多核 DSP 核间通信结构

王 镇, 汪 健, 张 磊

(华东光电集成器件研究所, 江苏 苏州 215163)

摘 要: 多核时代处理器内核间的通信是多处理系统所面临的主要难题.通过研究现有的分布式与共享式通信方式, 提出了一种采用分布式交点队列 (crosspoint-queued, CQ) 结构代替传统的共享通信结构, 并利用中断机制实现握手的思路, 设计了一种交点队列型多核 DSP 核间通信结构.并构建了一种共享式与分布式混合的 DSP 系统, 将两种结构进行了性能对比, 测试结果显示, 此结构通信效率优于共享式, 尤其大数据量时优势明显.

关键词: 多处理系统; 交点队列; 中断机制; 核间通信

Architecture of Inter-core Communication Using Crosspoint-Queued for Multi-Core DSPs

WANG Zhen, WANG Jian, ZHANG Lei

(East China Institute of Photo-Electron IC, Suzhou 215163, China)

Abstract: Multicore era, the main challenge of multi-processing system is inter-core communication. By studying the existing distributed and shared communication structure, this paper proposed the idea that using a distributed crosspoint-queued (CQ) instead of the traditional shared communication structure meanwhile handshaking by interrupt mechanism. An architecture of inter-core Communication using interrupt mechanism for multi-core DSPs is designed. From a system perspective, this design is compared with shared memory communication structure, the result shows that the designed is more efficient than the shared structure, especially when there are large amounts of data to transfer.

Key words: multiprocessing system; crosspoint-queued; interrupt mechanism; inter-core communication

作者简介:

王 镇 男, (1987-), 工程师.研究方向为多核 SoC 设计.

E-mail: wz_dly@163.com.

汪 健 女, (1969-), 研究员.研究方向为多核 SoC 设计.

张 磊 男, (1982-), 高级工程师.研究方向为多核 SoC 设计.